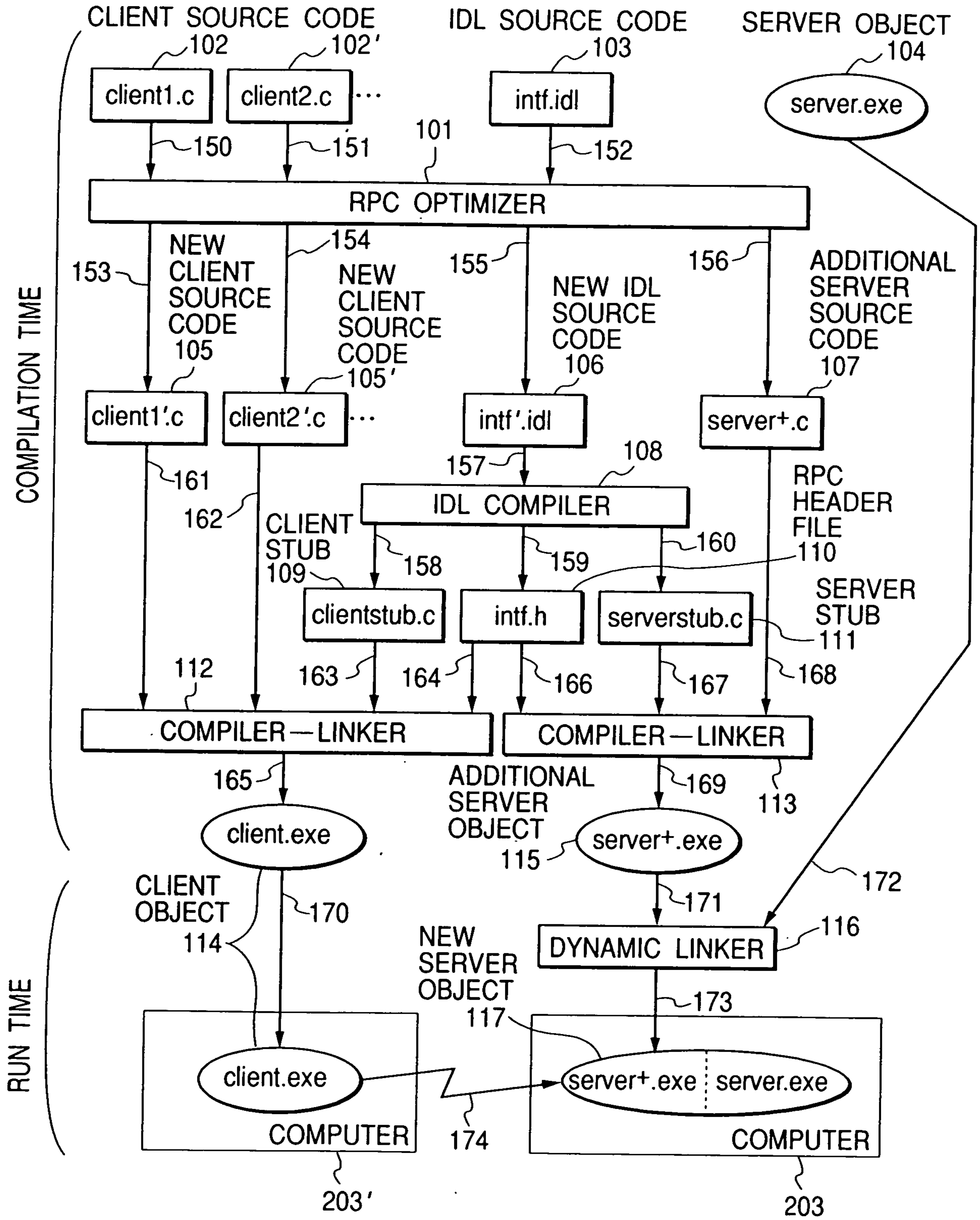
APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

FIG. 1



APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

FIG. 2

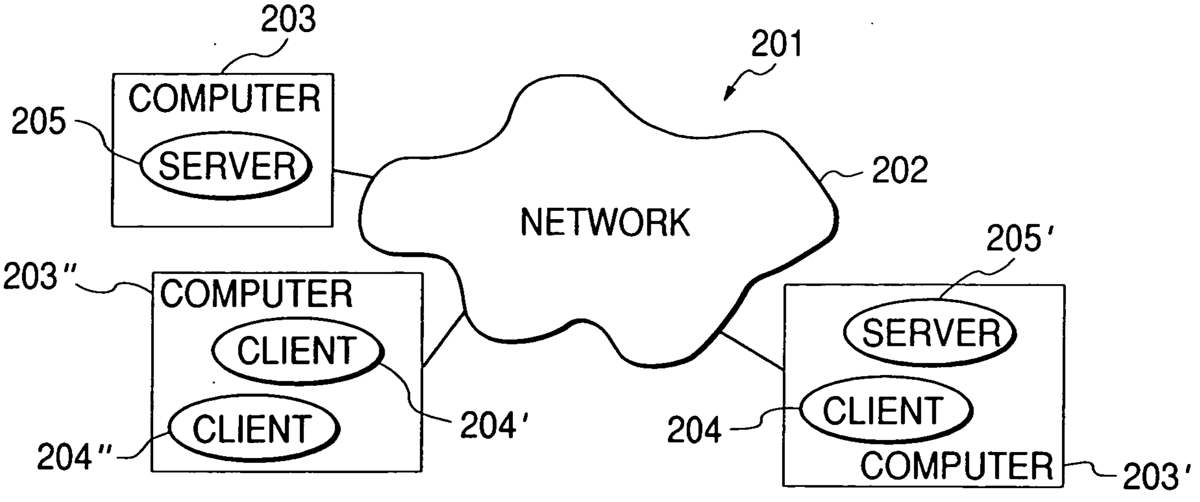
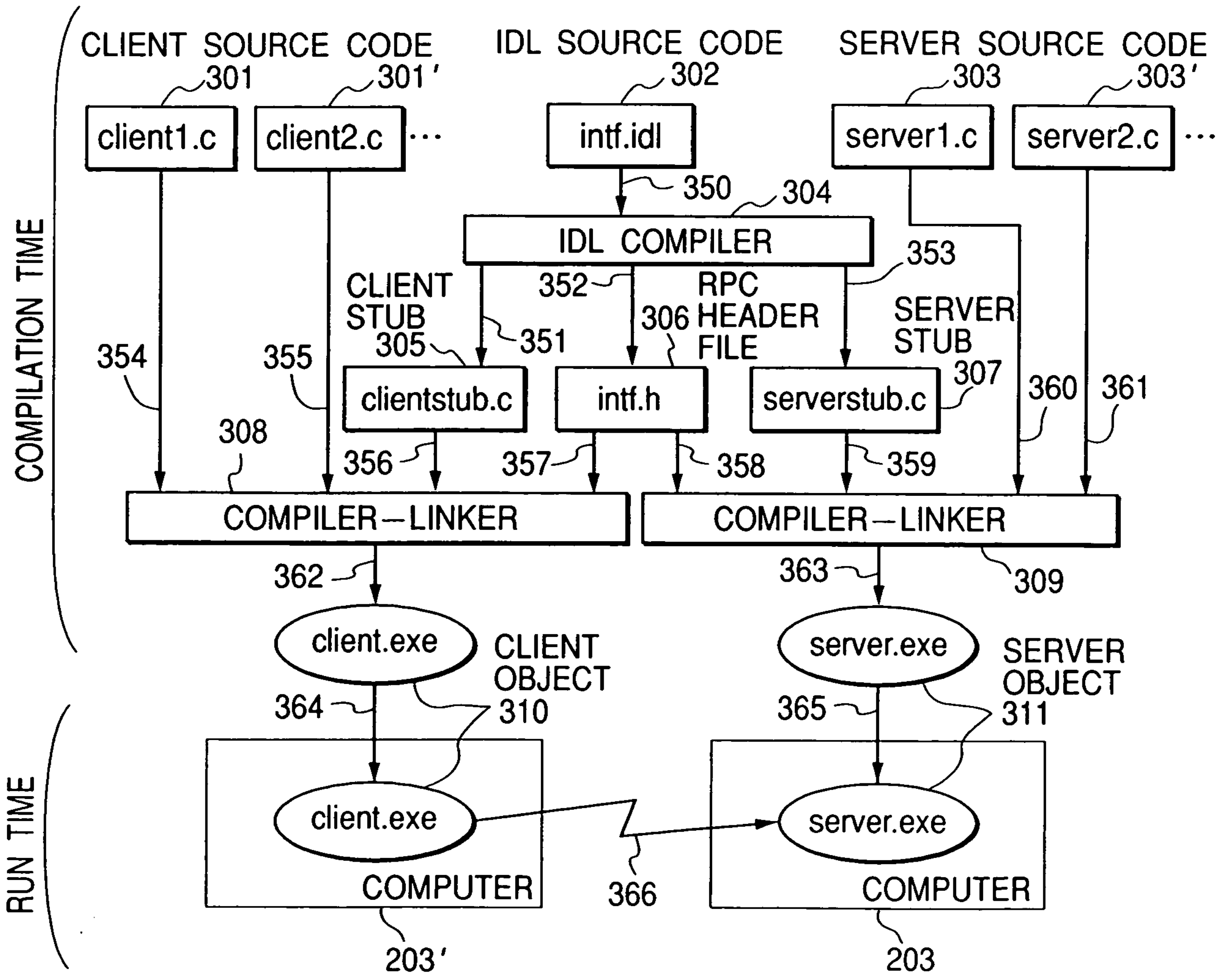


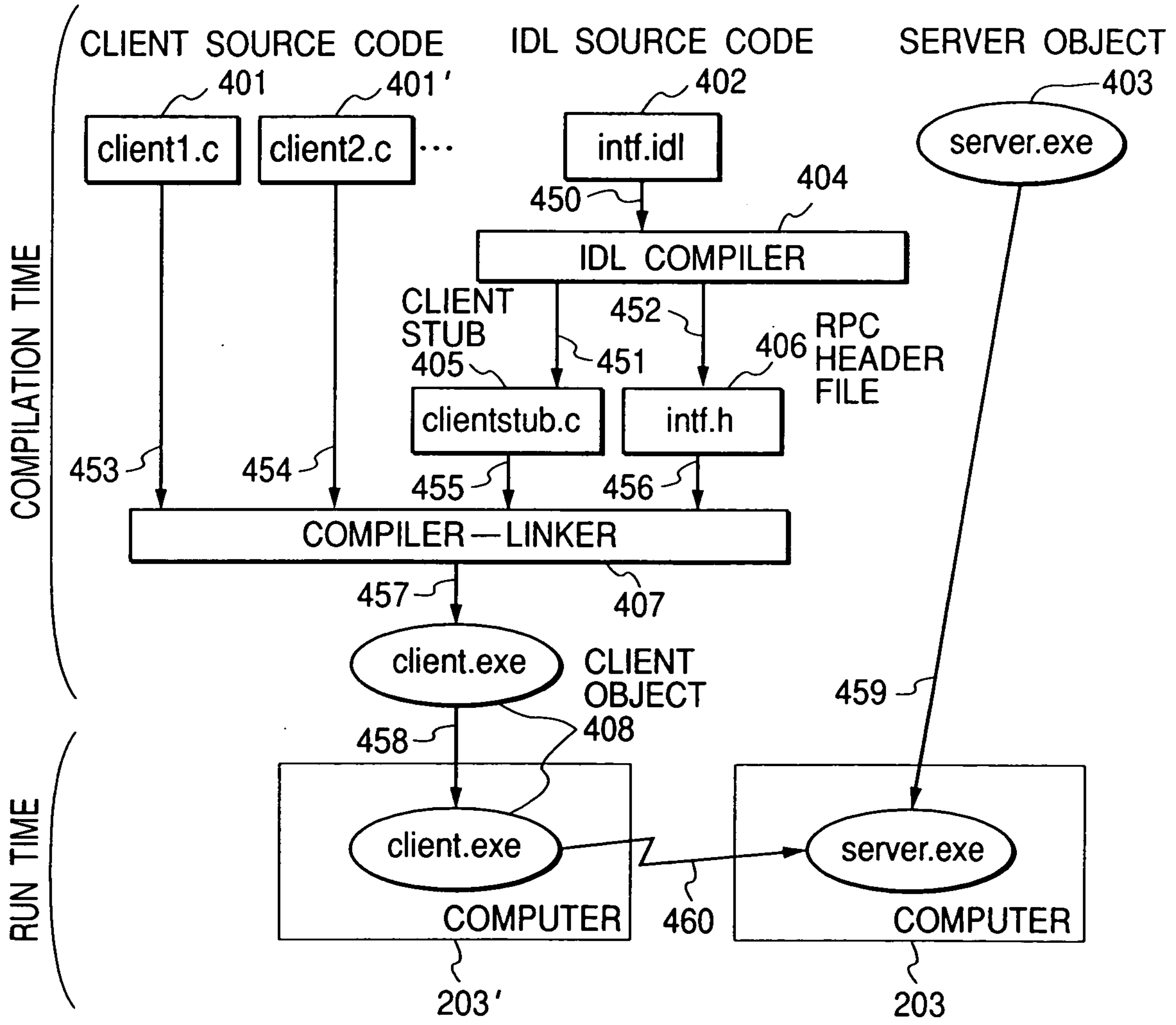
FIG. 3



APPROVED BY DRAFTSMAN
O.G. FIG.
CLASS SUBCLASS

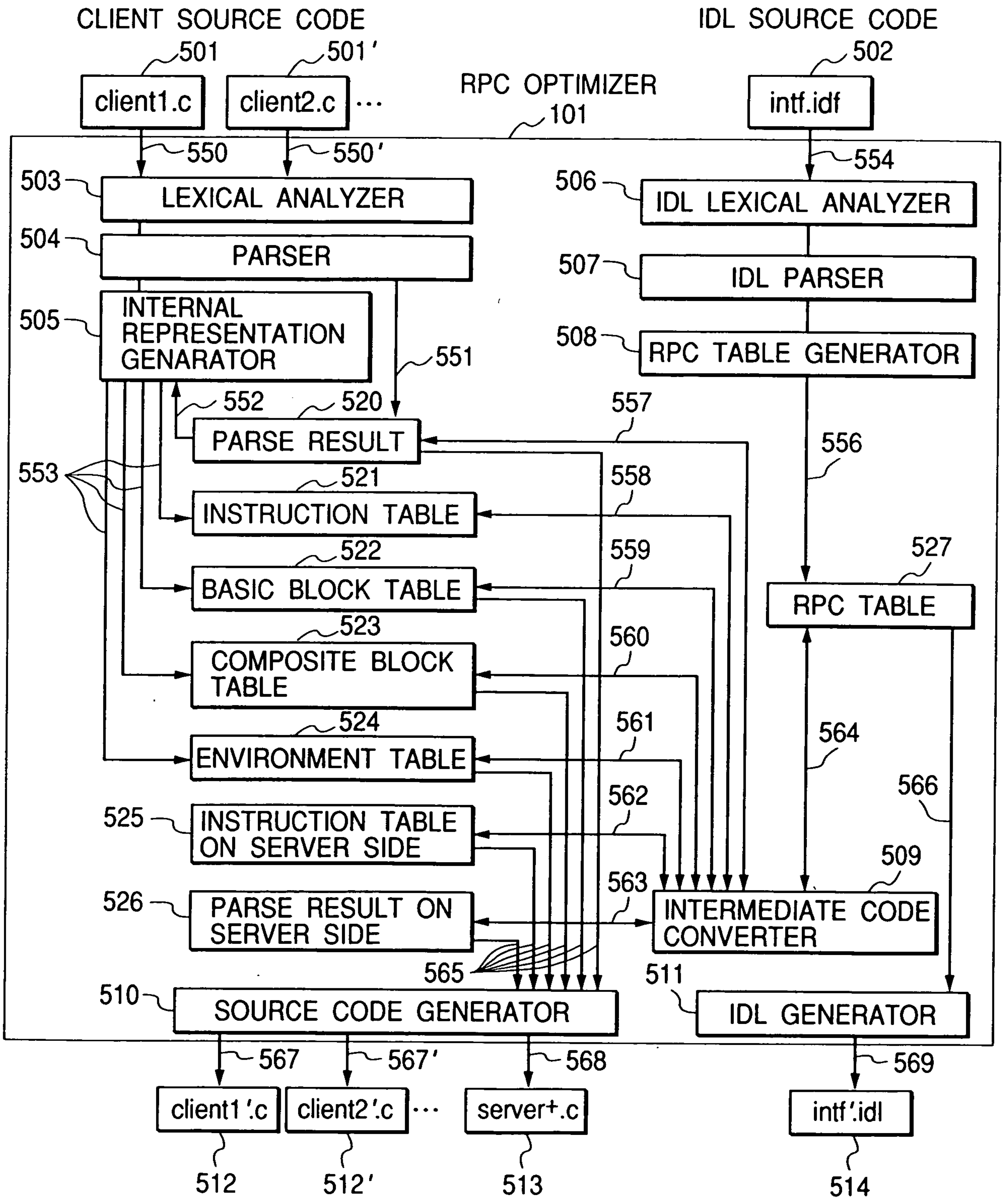
09405089.022699

FIG. 4



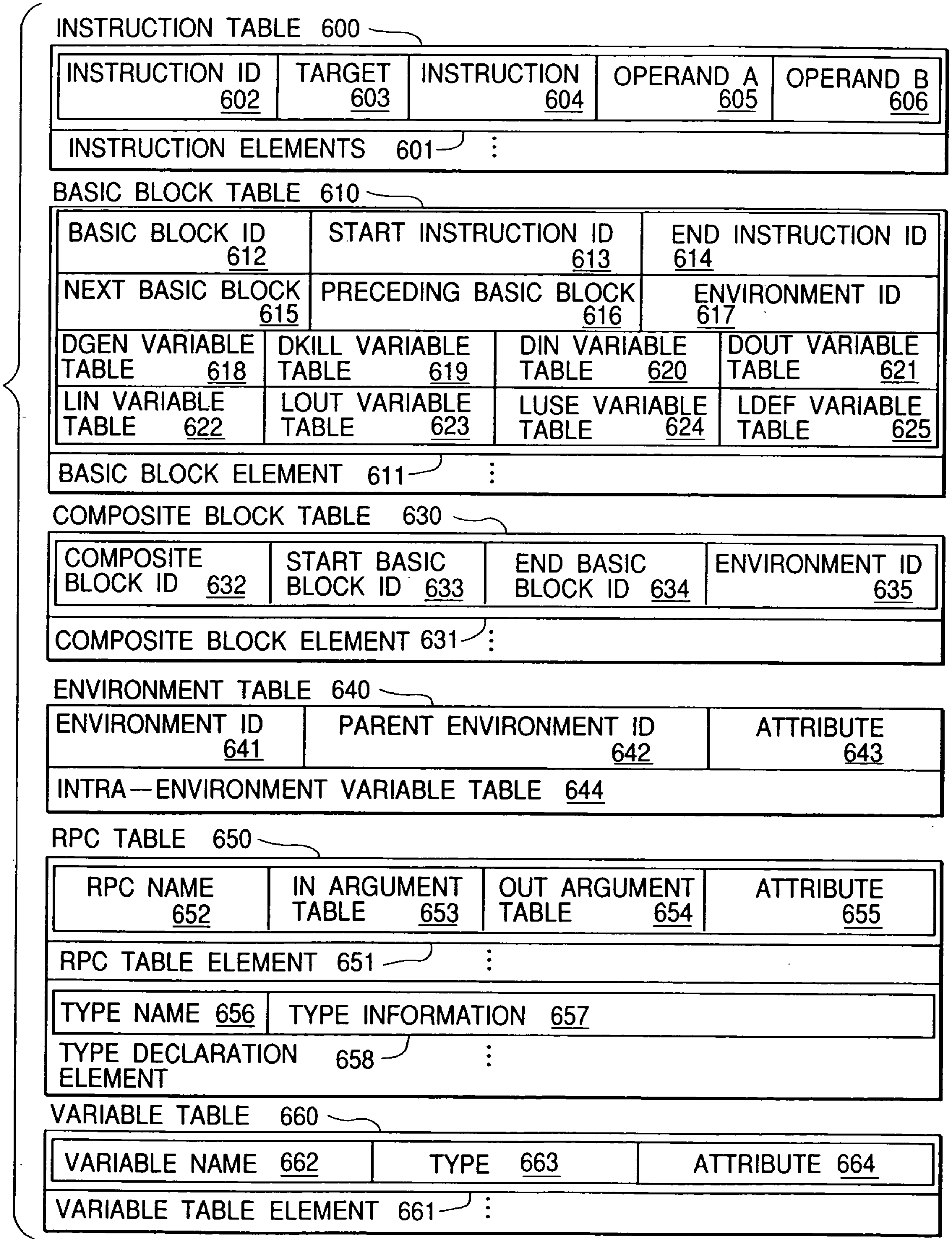
APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

FIG. 5



APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

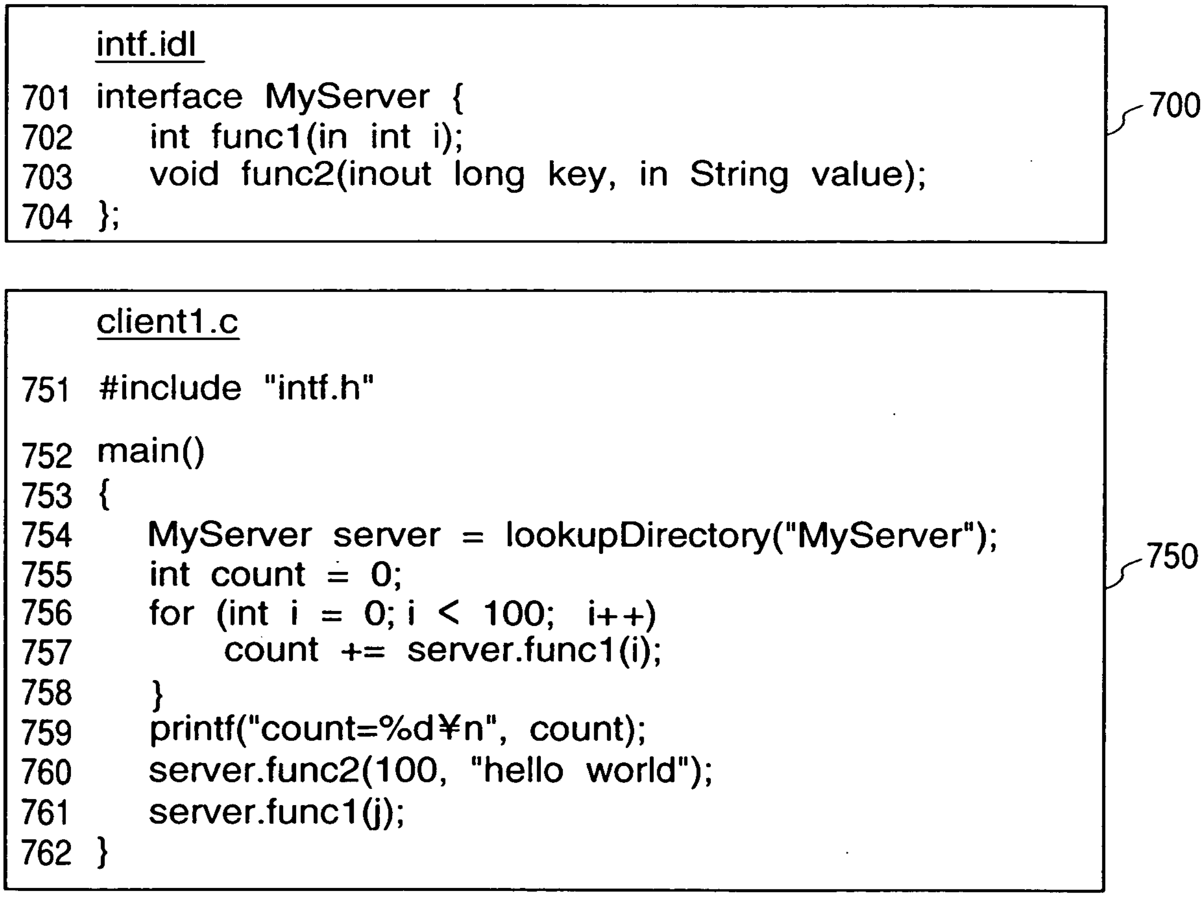
FIG. 6



09725660 . 63050460

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

FIG. 7



intf.idl

```
701 interface MyServer {
702     int func1(in int i);
703     void func2(inout long key, in String value);
704 };
```

client1.c

```
751 #include "intf.h"

752 main()
753 {
754     MyServer server = lookupDirectory("MyServer");
755     int count = 0;
756     for (int i = 0; i < 100;  i++)
757          count += server.func1(i);
758     }
759     printf("count=%d¥n", count);
760     server.func2(100, "hello world");
761     server.func1(j);
762 }
```

09672960.060504

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

09405089.062799

FIG. 8

800

intf.h

```
801 #include "Object.h"

802 class MyServer; public Object {
803     int func1(int i);
804     void func2(long& key, char* value);
805 }
```

850

clientstub.c

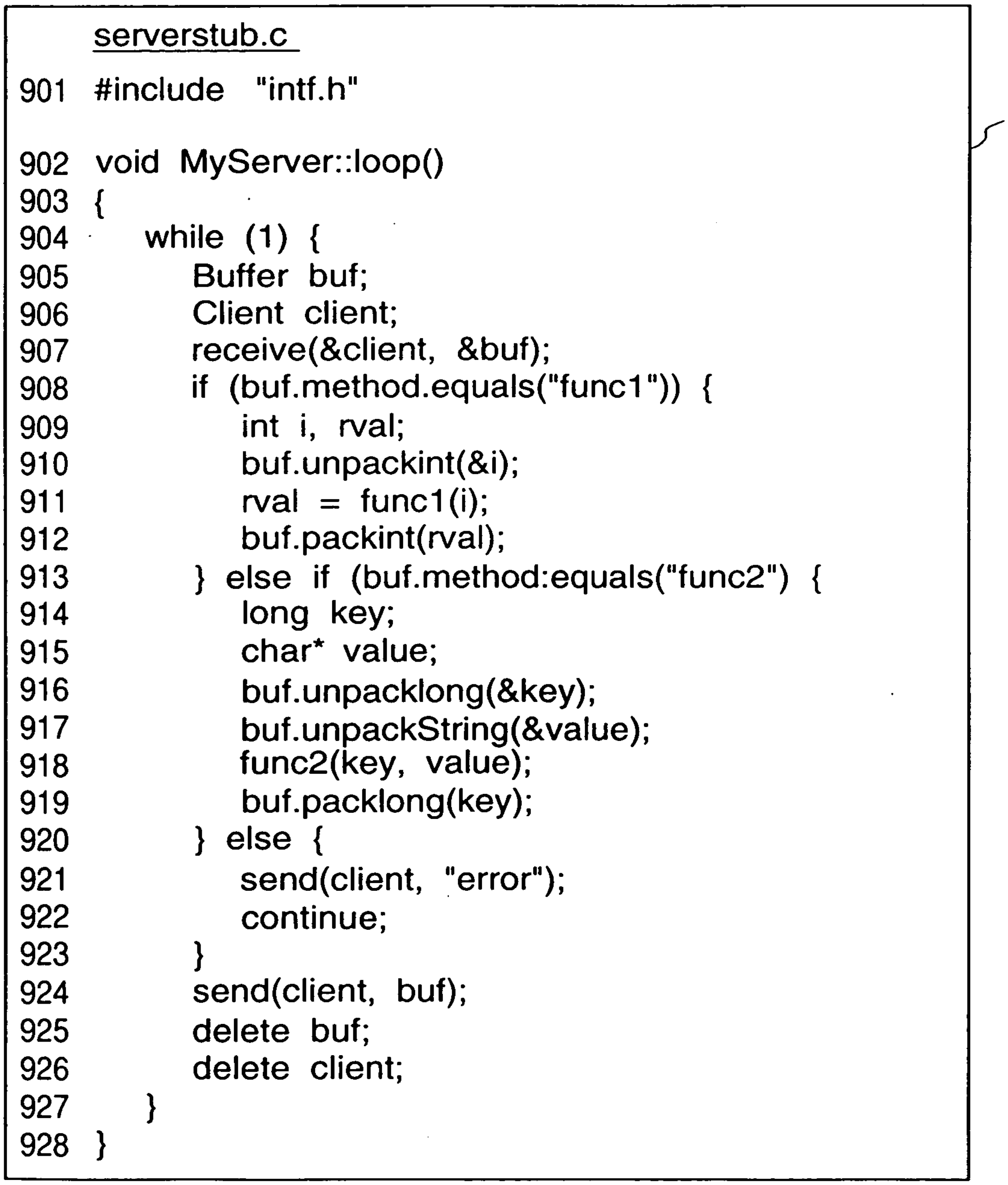
```
851 #include "intf.h"

852 int MyServer::func1(int i)
853 {
854      Buffer buf = new Buffer();
855      int rval;
856      buf.packint(i);
857      call("func1", buf);
858      buf.unpackint(&rval);
859      delete buf;
860      return rval;
861 }

862 void MyServer::func2(long& key, char* value)
863 {
864     Buffer buf = new Buffer();
665     buf.packlong(key);
866     buf.packString(value);
867     call("func2", buf);
868     buf.unpacklong(&key);
869     delete buf;
870 }
```

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

FIG. 9



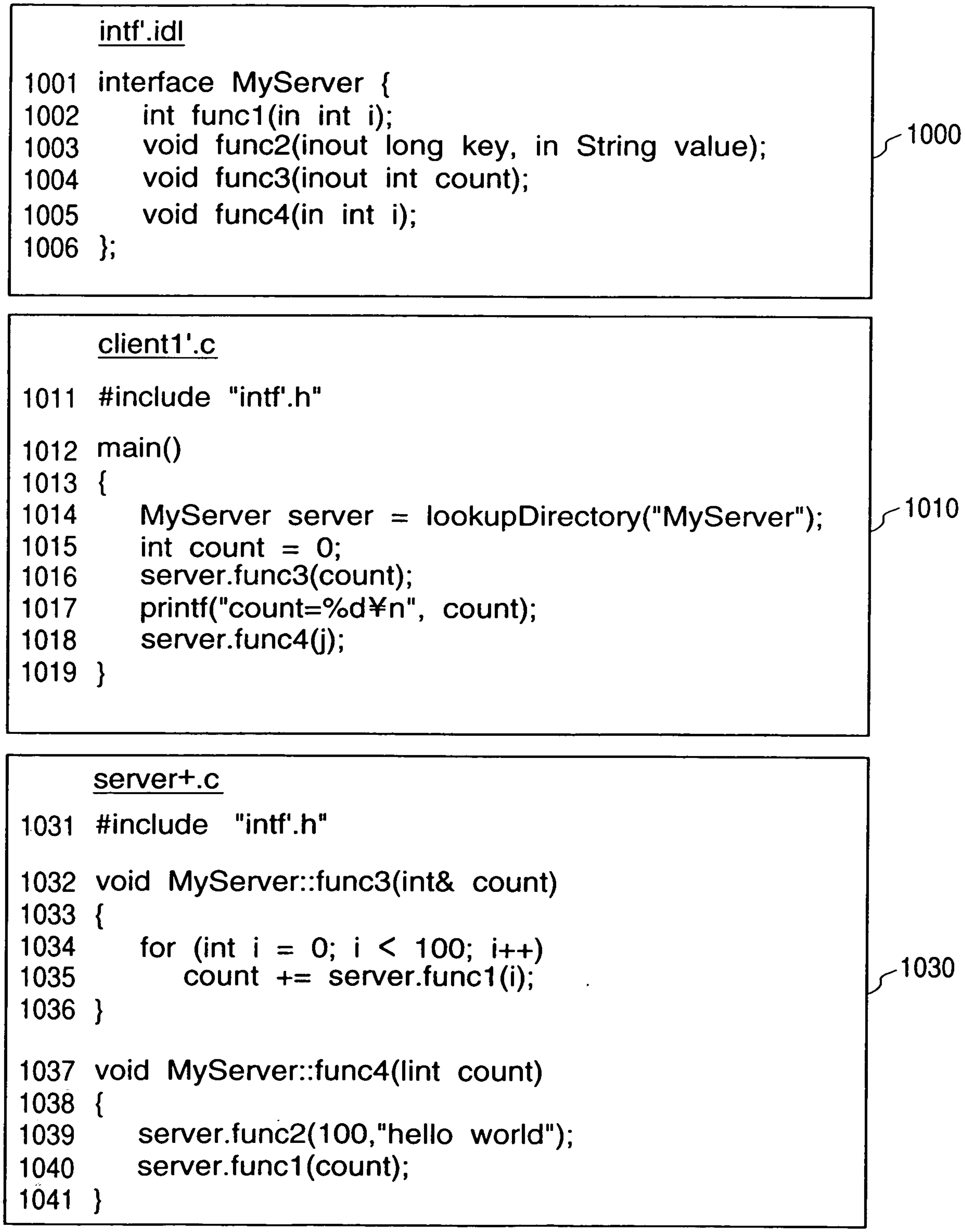
```
     serverstub.c
901  #include  "intf.h"

902  void MyServer::loop()
903  {
904     while (1) {
905        Buffer buf;
906        Client client;
907        receive(&client, &buf);
908        if (buf.method.equals("func1")) {
909           int i, rval;
910           buf.unpackint(&i);
911           rval = func1(i);
912           buf.packint(rval);
913        } else if (buf.method:equals("func2") {
914           long key;
915           char* value;
916           buf.unpacklong(&key);
917           buf.unpackString(&value);
918           func2(key, value);
919           buf.packlong(key);
920        } else {
921           send(client, "error");
922           continue;
923        }
924        send(client, buf);
925        delete buf;
926        delete client;
927     }
928  }
```

09405089 .092799

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

FIG. 10



1000
1010
1030

intf'.idl

```
1001 interface MyServer {
1002     int func1(in int i);
1003     void func2(inout long key, in String value);
1004     void func3(inout int count);
1005     void func4(in int i);
1006 };
```

client1'.c

```
1011 #include "intf'.h"

1012 main()
1013 {
1014     MyServer server = lookupDirectory("MyServer");
1015     int count = 0;
1016     server.func3(count);
1017     printf("count=%d¥n", count);
1018     server.func4(j);
1019 }
```

server+.c

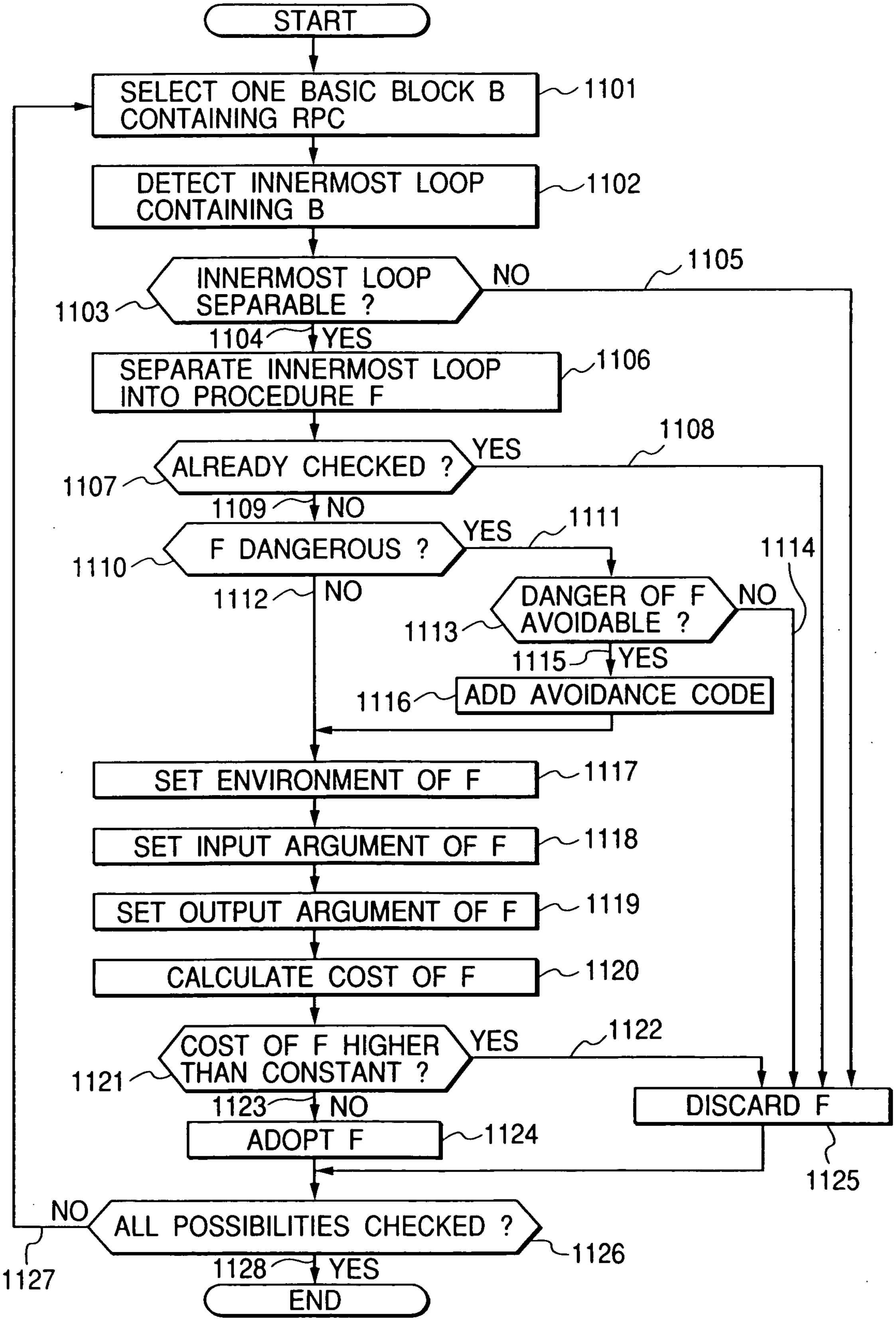
```
1031 #include "intf'.h"

1032 void MyServer::func3(int& count)
1033 {
1034     for (int i = 0; i < 100; i++)
1035         count += server.func1(i);
1036 }

1037 void MyServer::func4(lint count)
1038 {
1039     server.func2(100,"hello world");
1040     server.func1(count);
1041 }
```

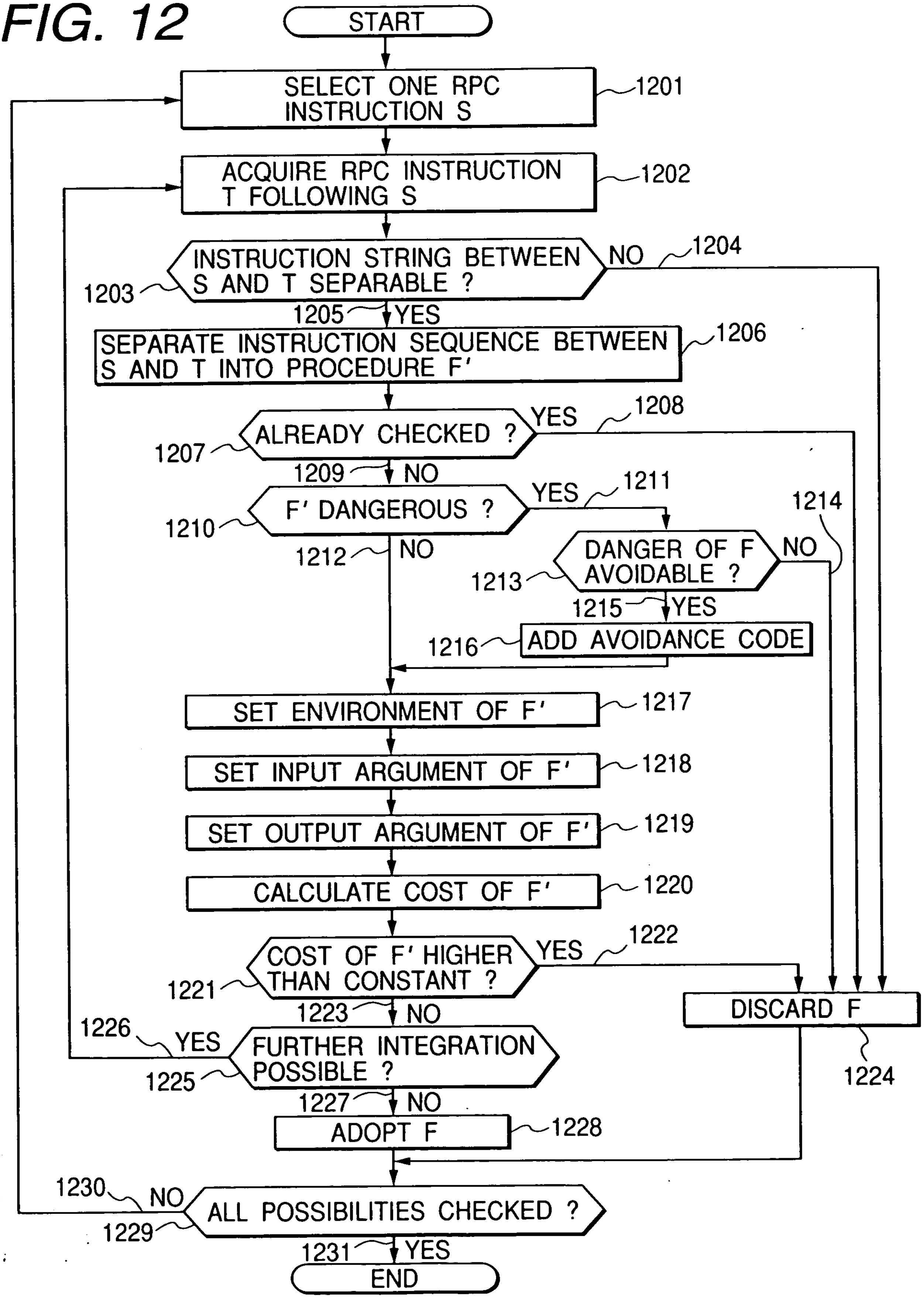
APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

FIG. 11



APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

FIG. 12



09405089 .092799

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

09527960 . 050400

FIG. 13

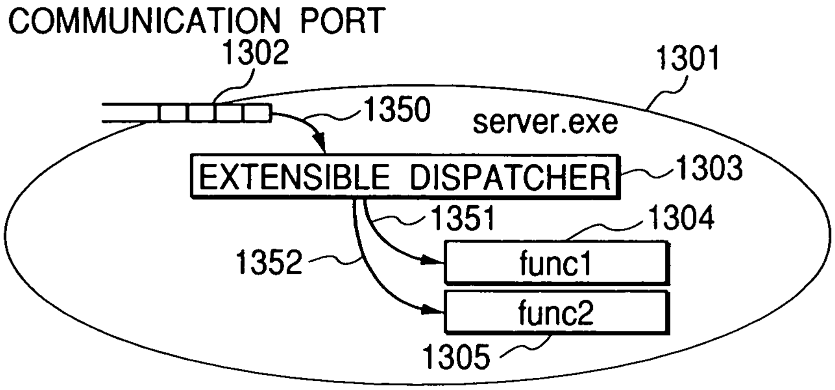
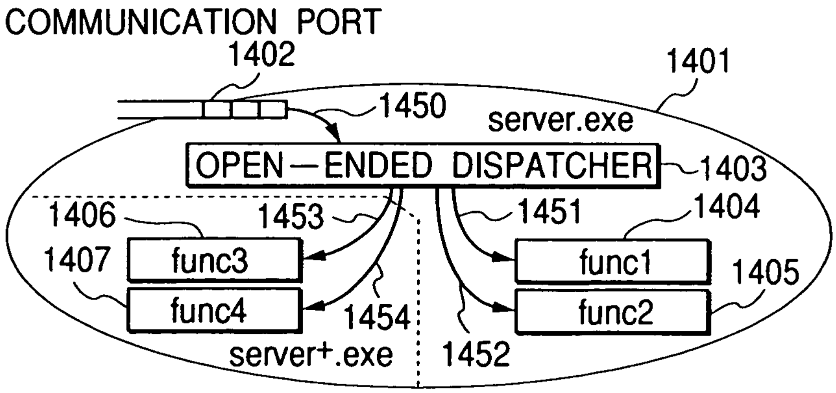
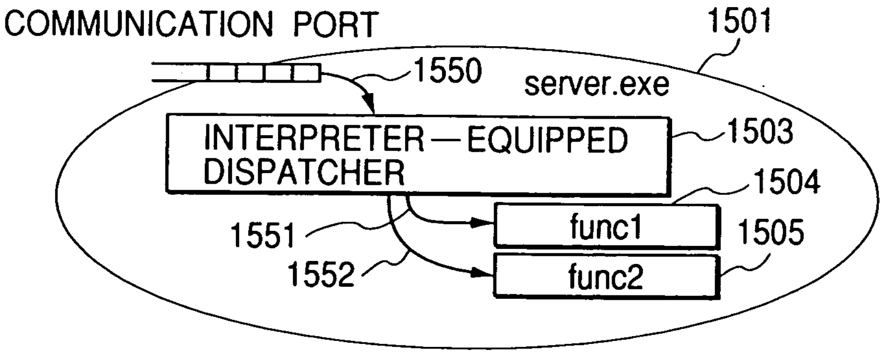


FIG. 14



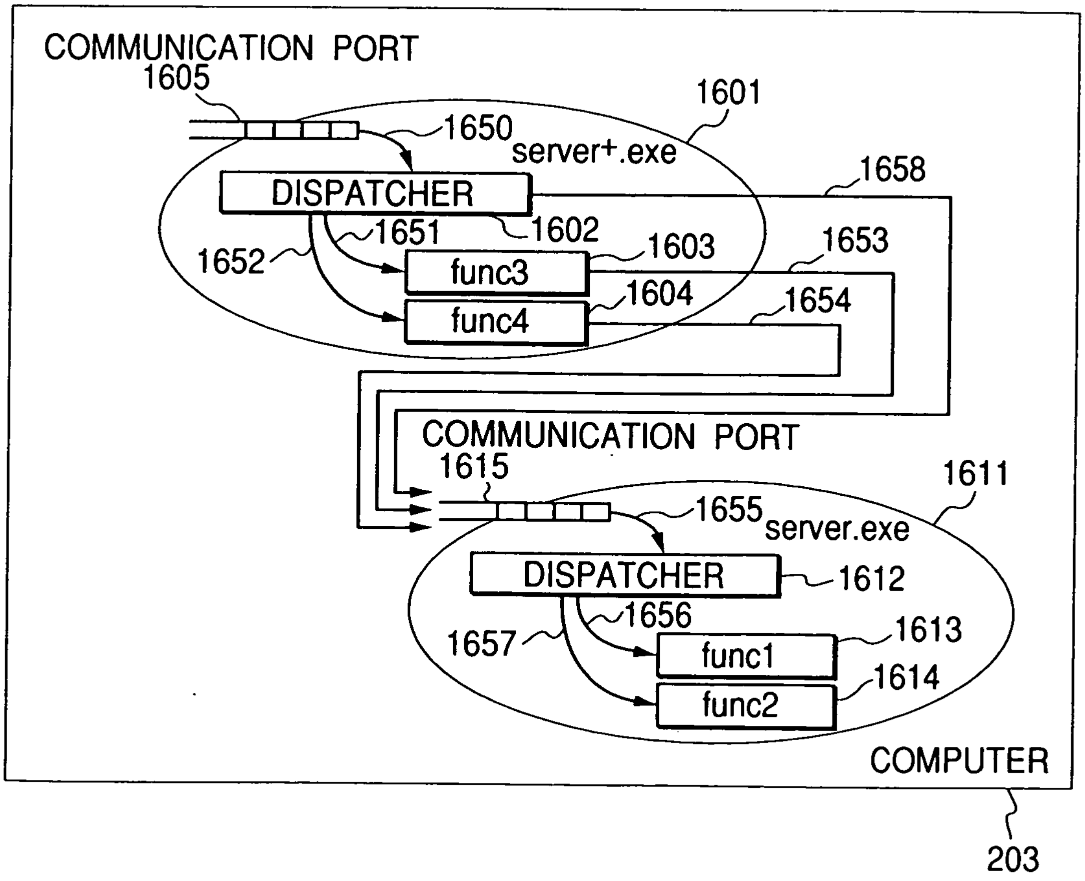
APPROVED | O.G. FIG.
BY | CLASS | SUBCLASS
DRAFTSMAN

FIG. 15



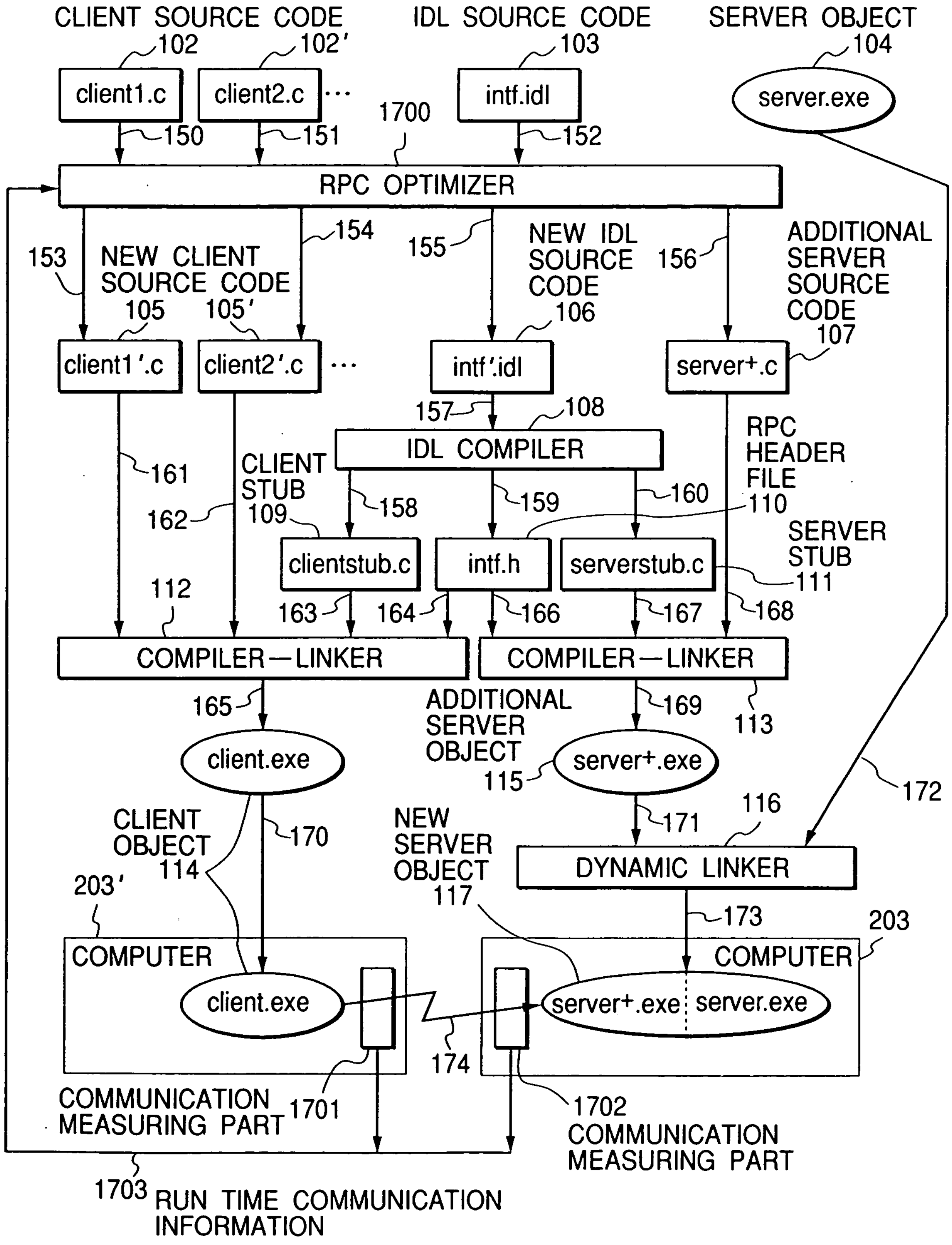
09605889 .062700

FIG. 16



APPROVED | O.G. FIG.
BY | CLASS | SUBCLASS
DRAFTSMAN

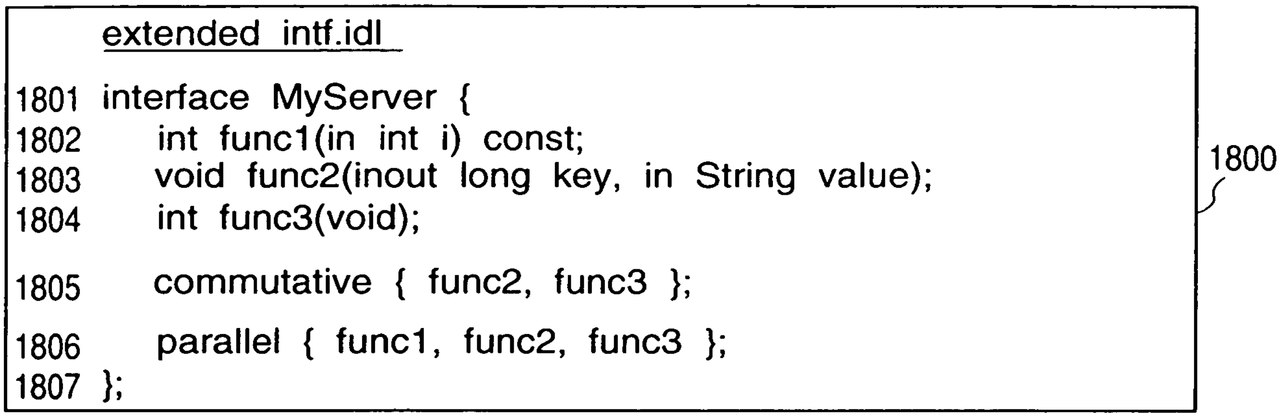
FIG. 17



09729595 - 080501

APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

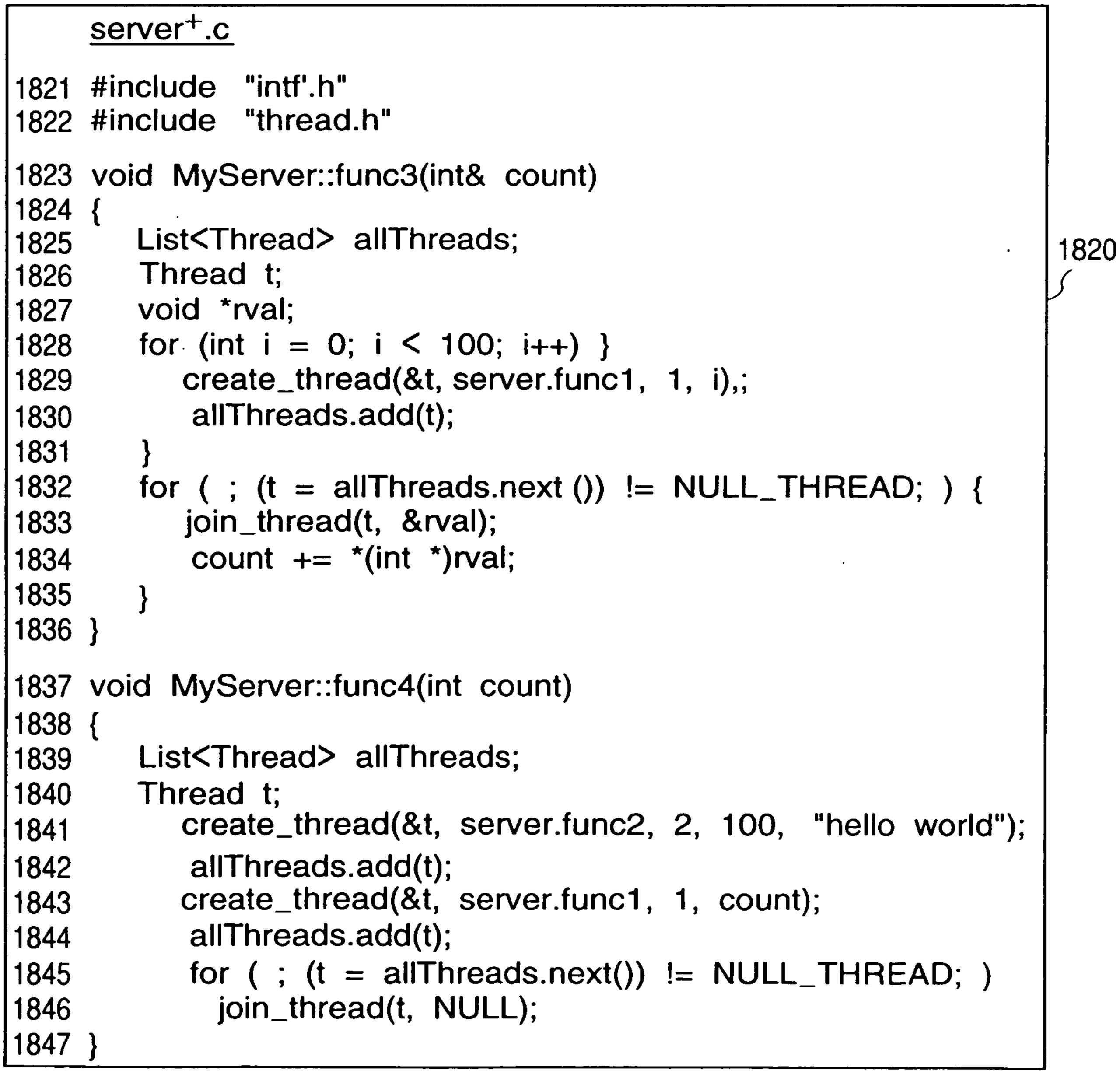
FIG. 18



extended intf.idl

```
1801 interface MyServer {
1802     int func1(in int i) const;
1803     void func2(inout long key, in String value);
1804     int func3(void);
1805     commutative { func2, func3 };
1806     parallel { func1, func2, func3 };
1807 };
```

09645089.062702

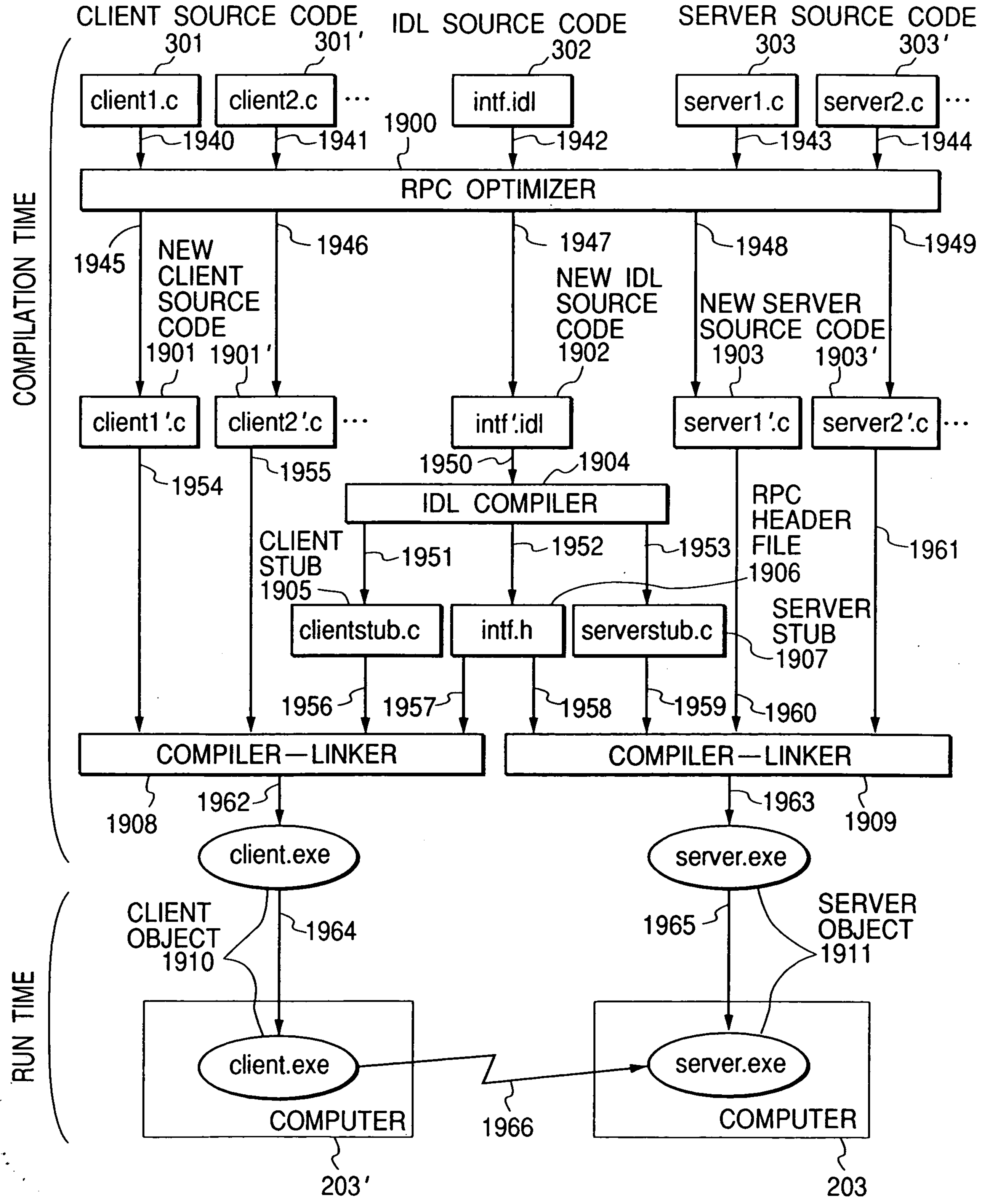


server+.c

```
1821 #include "intf'.h"
1822 #include "thread.h"
1823 void MyServer::func3(int& count)
1824 {
1825     List<Thread> allThreads;
1826     Thread t;
1827     void *rval;
1828     for (int i = 0; i < 100; i++) }
1829         create_thread(&t, server.func1, 1, i),;
1830          allThreads.add(t);
1831     }
1832     for ( ; (t = allThreads.next ()) != NULL_THREAD; ) {
1833         join_thread(t, &rval);
1834          count += *(int *)rval;
1835     }
1836 }
1837 void MyServer::func4(int count)
1838 {
1839     List<Thread> allThreads;
1840     Thread t;
1841         create_thread(&t, server.func2, 2, 100, "hello world");
1842          allThreads.add(t);
1843         create_thread(&t, server.func1, 1, count);
1844          allThreads.add(t);
1845          for ( ; (t = allThreads.next()) != NULL_THREAD; )
1846            join_thread(t, NULL);
1847 }
```

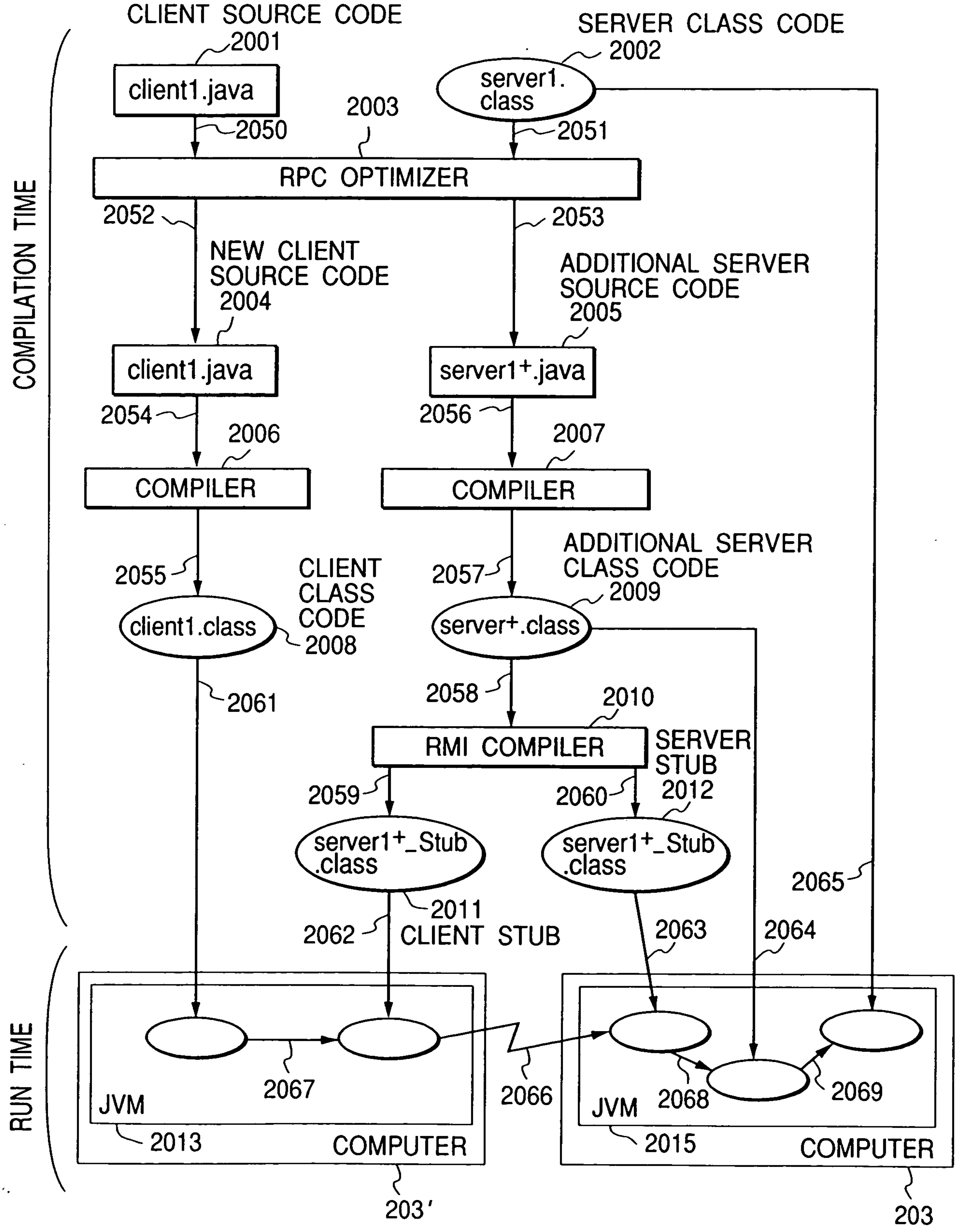
APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

FIG. 19



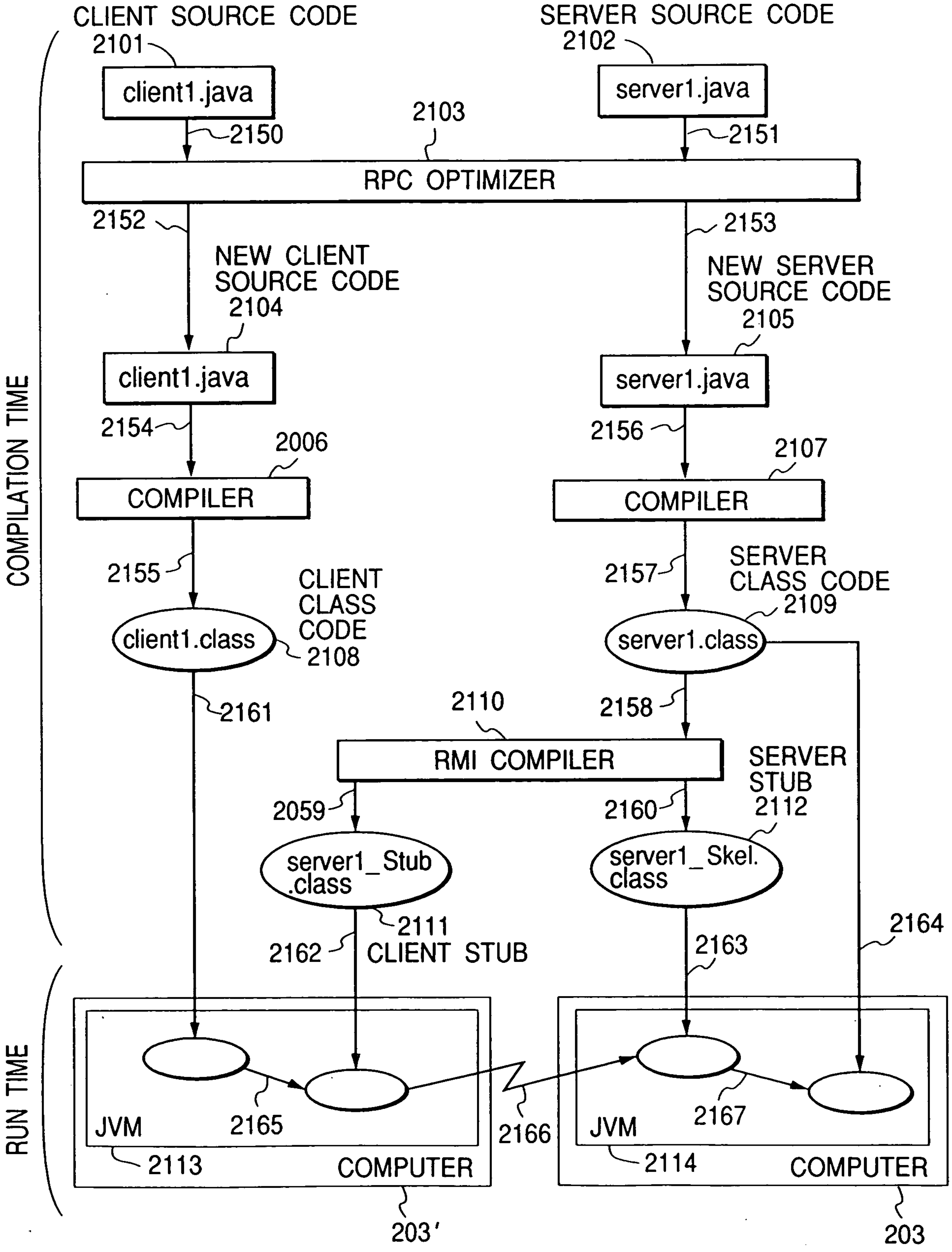
APPROVED BY DRAFTSMAN	O.G. FIG.	
	CLASS	SUBCLASS

FIG. 20



APPROVED BY DRAFTSMAN | O.G. FIG. | CLASS | SUBCLASS

FIG. 21


CLIENT SOURCE CODE
2101
client1.java
SERVER SOURCE CODE
2102
server1.java
2150
2151
2103
RPC OPTIMIZER
2152
2153
NEW CLIENT SOURCE CODE
2104
NEW SERVER SOURCE CODE
2105
client1.java
server1.java
2154
2156
2006
2107
COMPILER
COMPILER
2155
2157
CLIENT CLASS CODE
2108
client1.class
SERVER CLASS CODE
2109
server1.class
2161
2110
2158
RMI COMPILER
SERVER STUB
2112
2059
2160
server1_Stub .class
server1_Skel. class
2111
CLIENT STUB
2162
2163
2164
COMPILATION TIME
RUN TIME
JVM
2165
2113
COMPUTER
203′
2166
JVM
2167
2114
COMPUTER
203